



Delhi Public School

Kolar Road Bhopal

ASSIGNMENT [No. - 1] 2018 - 2019

CLASS : XI

SUBJECT : MATHEMATICS

Issue Date : _____

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Name: _____ Roll No _____ Class _____ Sec _____

CHAPTER 1 - SETS

- Q1. Write the following sets in the set builder form.
- $\{ 1, 5, 10, 15, \dots \}$
 - $\{ B, E, N, G, I \}$
 - $\{ 14, 21, 28, 35, 42, \dots, 98 \}$
- Q2. Write power set of $\{ a, b, c \}$
- Q3. Write proper subsets of $\{ 1, 2 \}$
- Q4. Write the number of elements in $P(A)$ if A is a set of vowels in English alphabet.
- Q5. Write the following sets in interval form.
- $\{ x : x \in \mathbb{R}, -8 < x < 3 \}$
 - $\{ x : x \in \mathbb{R}, -1 < 4x - 1 \leq 9 \}$
- Q6. Taking \mathbb{N} , the set of natural numbers as the universal set, write down the complement of following sets:
- $\{ x : x = n^2, n \in \mathbb{N} \}$
 - $\{ x : x \text{ is divisible by 3 and 5, } x \in \mathbb{N} \}$
- Q7. Using the laws of set algebra show that:
- $(A \cup B) \cap (A \cup B') = A$
 - $(A - B) \cup (A \cap B) = A$
 - If $A \cap B' = \emptyset$, show that $A \subset B$
 - If $A' \cup B = U$ show that $A \subset B$.
- Q8. In a survey of 100 persons it was found that 28 read magazine A, 30 read magazine B, 42 read magazine C, 8 read magazine A and B, 10 read magazine A and C, 5 read magazine B and C and 3 read all the three magazines. Find:
- How many read none of the three magazines.
 - How many read magazine C only.
 - How many read exactly two magazines.

- Q9. Is it true for any sets A and B; $P(A) \cup P(B) = P(A \cup B)$? Justify your answer.
- Q10. Find sets A,B and C such that $A \cap B$, $B \cap C$ and $A \cap C$ are empty sets and $A \cap B \cap C = \emptyset$.
- Q11. Verify the following using Venn diagram :
- $(A \cap B)' = A' \cup B'$
 - $(A \cup B)' = A' \cap B'$
 - $A - B \neq B - A$

RELATIONS AND FUNCTIONS

- Q1. If $A = \{1\}$ and $B = \{2, 3\}$, find the power set of $A \times B$.
- Q2. If $A \times B = \{(p,q), (p,r), (m,r), (m,q)\}$, find A and B.
- Q3. Find the domain and range of the following relations:
- $R = \{(x,y): y = x^3, x \text{ is a positive prime number less than } 10\}$
 - $R = \{(x+2,x+4): x \in \{0,1,2,3,4,5\}\}$
- Q4. (a) If $f: \mathbb{R} \rightarrow \mathbb{R}$ is defined by $f(x) = \frac{x}{x^2+1}$, find $f(f(2))$
- (b) Let $f(x) = x + 1$, $g(x) = \frac{x^2-1}{x-1}$. Is $f = g$?
- Q5. Find the domain and range of the function $f(x) = \sqrt{x^2 - 3x + 2}$
- Q6. Let f and g be two functions defined by $f(x) = \sqrt{x-2}$ and $g(x) = \sqrt{x^2-1}$, describe the functions: (i) $f+g$ (ii) $g-f$ (iii) f/g (iv) g/f .
- Q7. Define Greatest Integer Function and draw its graph.
- Q8. Define Signum Function and draw the graph.
- Q9. If $A \subseteq B$ and $C \subseteq D$, prove that $A \times C \subseteq B \times D$
- Q10. Let A and B be two sets such that $n(A)=3$ and $n(B)=2$. If $(x,1), (y,2), (z,1)$ are in $A \times B$, find A and B where x,y,z are distinct.
- Q11. Express the function $f: \mathbb{N} \rightarrow \mathbb{N}$ defined by $f(x)=2x+3$ as a set of ordered pairs of and find range f.
- Q12. Let $f = \{(1,1), (2,3), (0,-1), (-1,-3)\}$ be a linear function from \mathbb{Z} to \mathbb{Z} defined by $f(x)=ax+b$ for some integers a,b. Determine a and b.
- Q13. If f is a real function defined by $f(x) = \frac{x-1}{x+1}$, then prove that: $f(2x) = \frac{3f(x)+1}{f(x)+3}$
- Q14. Find the domain of the following function. $f(x) = \frac{x^2 + 2x + 1}{x^2 - 8x + 12}$
- Q15. Find the domain and range of the function, $f(x) = |x - 1|$

